the art naturally springs up and grows among the productions of the progress of the mind. The origin of architecture is in the simple circumstance that the beautiful, as a universal object of intellectual endeavour, becomes introduced in one thing after another of human work, and, in its proper turn, in building. Theories of the origin of architecture in some occult cause for a stone temple being fashioned like a wooden hut,—or in some mysterious development of religious feeling in cromlechs,—or in some romantic imitation of basket-work in the basilicæ,—or in a miraculous plan for Solomon's Temple sent down from heaven, with the five blessed orders all fairly set out by the archangel, as in later days by the mantua-maker upon the petticoat of the court lady of Queen Anne,—or in an equally miraculous conception of heaven-ordained symbolism whereby the church fabric no less than the church catechism becomes a source of instruction and comfort in the faith,—theories like these may do very well for such persons as can credit them, but for you and your friends take the plain and manifest truth, however vulgar and impoverished, for it will go the farthest. In every quarter of the globe, and in every age, we can more or less trace this simple fact, that the human mind, slowly and feebly opening into the common cement of intellect, displays with its desire for progress in other things a similar desire for beauty. The naked savage in every case begins to manifest a taste for elegance and ornament: his notions of these may, it is true, be very primitive; but how could they be otherwise? At the same time that he acquires the art of forming a canoe, building a hut, making a bow and arrows, snaring the creatures of the plain, conquering the beasts of prey, capturing the elk, the ostrich, or the bull, clothing himself in skins, cooking his food, expressing the complications of his thoughts in words, curing his diseases, worshipping his gods, he begins to ornament his person with paint, to plait his hair, to cover his sweet face with tattoo, to hang rings from his nose, to make a glorious cap of feathers, to carve his bow or his pipe, to sing his song of war or love, to embellish his discourse, to delineate symbols and forms, to sculpture his idols, to beautify his house. What is there in architecture that it should have a different rise from that of other arts and objects of endeavour? Everything grows up alike, first the blade, then the ear, then the full corn in the ear.

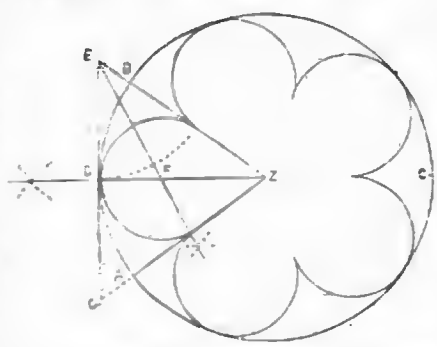
The fine art of architecture is of two elements, constructive beauty and ornament. It would be perhaps impossible to mark the exact line which separates these where they meet in practice, but in theory they are essentially distinct,—the beautification of the mere principles of structure on the one hand, and on the other the subsequent extrinsic decoration with ornament. And, therefore, of necessity, the first step is to throw grace of form (so to speak) into the otherwise previously determined design of structure, and the previously known system of science, and the next step to fashion ornaments, to adorn and embellish in detail. Here, then, are the lamps of Building and Science previously burning, and how can you light the lamp of Art without their flame? It is also from this point that all the systems of the styles must spring: these are but the diverse developments of the same theme in diverse circumstances. There can be no caprice in style,—it is not open to a man to choose—as we attempt to do too much—I will have such a style. The style is the natural result, the offspring, of the proper plan and the available material: you may choose your style without limit, if you may choose this proper plan and this material; but if these are given in perfect theory your style is, to a greater extent than you may think, given also. To depart from this is to attempt Art in defiance of Science and Building, and the result can only be visionary and vain—disguise, mockery, and sham.

What need I say more to you on art? I think of only one thing: all the association in the world can never make the divine the earthy, or art any meaner thing. For all that I have said, architecture proper as a fine art need not, in the first place, be put in any confusion with science or building in the elements and essences; and in the second place, it has no association at all with the craftswork and artisanship of these inferior things: it ranks with painting and sculpture, music the enthralling, and poetry the divine. It is the creation of the beautiful,—the pursuit of the spirit which pervaded heaven before the earth was,—and it is to be classed with the search for the profound and true, and the following of the noble and the good. This is no rodomontade: it may not be a businesslike principle for a man to ponder over at his desk, but it is, I maintain, a principle of art and poetry for a quiet hour of reverie—that reverie of the relaxed soul when the vision is the true reflection rather than the false of the mirror of Nature. My son, be a man of business for the day, but in the still evening, or the wakeful night, a Sabbath-hour of reverie is balm to the chafed limbs and refreshment to the weary spirit. K.

THE FOLIATION PROBLEM.

It is not necessary to use natural sines, or anything beyond natural sense, to solve the very simple problem to which "T." has applied his trigonometry; and which, being one of the most constant occurrence in the prevailing fashion of stone tailoring (or structure disguising) ought certainly to be met by all practisers of that noble art, in some more "simple and ready method" than the very barbarous one of "trials," or the tremendous heavy artillery which "T." brings to bear on it.

Let A B C be the circle to be foliated, Z its centre, A B Z the sector that will contain one foil. Bisect it by the line Z D, and erect D E, a perpendicular to this (or tangent to the circle). Continue Z B to meet D E at E. Bisect the angle Z E D by the line E F,—crossing Z D at F, which is the centre of the required foil.*



The demonstration is too simple to be worth transcribing. On referring to his Euclid's Elements (which are also the architect's indispensable elements, whether in Gothic or any other style) the reader will find it under the problem, "to inscribe a circle in a given triangle," to which this case of course reduces itself, the circle of the foil being required to touch all three sides of the isosceles triangle Z E G.

It should hardly be necessary to add that the circle operated on in this manner must be neither the innermost nor outermost of those constituting the ring of moulding, but only that exact circle, real or imaginary, which (to borrow an expression from the machinists) I may call the *pitch-line* of the foliation, viz., that which touches those circles, in each foil, which touch each other. In the methodised and invariable mode of *clubbed* foiling (as Professor Willis calls it) used in all Europe during the *decline* of Gothic art, and never before, the pitch-line is always an imaginary one, on the surface of the innermost moulding (or *foil-hollow*), and distant from the intrados by half the width of one of the clubbed points. Thus, if the points are to be half an inch wide, the circle A B C above must have its radius a quarter of an inch greater than that which the intrados would have if not foiled, and the intrados of each foil will have its radius a quarter of an inch less than F D.

I believe, by the bye, you will find no instance, either in tracery or foliation, of the division of a circle into *nine* parts (the number in "T.'s" diagram) because, the whole Gothic system being purely *geometrical*, and never necessitating, as "T." supposes, any recourse to algebra (which in those days had not come north of the Alhambra; and besides common algebra is unable to effect anything which Euclid's geometry cannot), the Gothic artists ignored all division by "trials" or other barbarous and inexact methods. Now a circle cannot be divided geometrically (nor *exactly* by any means) into 7, 9, 11, or 13 sectors. If Mr. Barry, however, wished to show the progress of geometry between the building of Westminster Abbey and Westminster Palace, he might do so by erecting a rose or marigold of *seventeen* divisions, which the German geometer, Gauss, has lately shown to be possible by graphic construction. But, then, to show that it was fairly and legitimately done,—a piece of science and not of mere "industry,"—it would have to be so connected with the enclosed or surrounding tracery, as to develope or prove its derivation from the quantities $\sqrt{2}$ and $\sqrt{3}$, the factors whose combinations *alone* occur in Gauss's remarkable formula expressing the exact value of sin. $\frac{1}{17}$°. This would require some study. I have not yet found an instance in which the far simpler connection of the pentagon and square (or of sin. 36° with $\sqrt{2}$ and $\sqrt{3}$) is displayed, but have little doubt there are instances, if not in the continental Gothic, at least in the Arab or Arab-Gothic buildings. Had Wren lived in the Gothic times, he would have left us some such combination exhibited either in tracery or in the plans of some more magical Walbrook or Bow; and I have no doubt El Geber has left it somewhere. E. L. G.

THE CLASSIFICATION OF MEDIÆVAL ARCHITECTURE.

I have just read Mr. Parker's letter in The Builder, of October 18th. As I have no inclination to enter into a general discussion with him, I will confine myself, in this letter, to one or two points which I ought not, perhaps, to leave unnoticed. Any one who is acquainted with the Church of the Holy Sepulchre, or has seen Professor Willis's admirable description of it, must be aware that it consists principally of two portions, namely, first, the rotunda, or circular building surrounding the Holy Sepulchre itself, and built by the Emperor Constantine Monomachus at the commencement of the 11th century; and second, the choir, erected by the Crusaders on the east side of this rotunda, between the years 1100 and 1187: nor can there be any doubt, either that the arches of the former building (before the fire of 1808) were *circular*, or of the latter, *pointed*. I need scarcely add that it is the former building, and not the latter, which has served as the *model* according to which so many buildings of similar form have been erected in different parts of Christendom.

When, therefore, your correspondent, "F. S. A.,"* spoke of Earl Simon's having taken the Church at Jerusalem as his "model" for the church, which he asserts he constructed at Northampton, on his return, before A.D. 1127, and proceeded to account for the pointed arches in the latter by alleging the fact that "they are found in his model," I have no doubt that your readers would conclude, as I did, that "F. S. A." alluded to the arches of the rotunda; and I accordingly denied that they were pointed. It appears, however, as now explained by Mr. Parker, that "F. S. A." meant to refer to the pointed arches of the choir, which, nevertheless, were not in his model, and would have us believe that these arches, or rather their form, was imported from Perigord to the Holy Land, and transplanted thence to Northampton; and also that the Crusader's Choir was so far advanced before Earl Simon left the Holy Land, so as to enable him after his return to complete his church at Northampton

* Four other correspondents will find in this communication reason for not inserting their's.—Ed.

* Page 431, *ante*.